DE 199 09 143 A1 (excerpt)

As indicated in Figure 1, an automobile 1 has one side member 3 each in the region of the vehicle floor and disposed on the left and right sides of the vehicle as indicated by reference number 2. In vehicle 1, these side members 3 form a left vehicle door sill 4 and a right vehicle door sill 5 relative to the direction of travel 2.

According to the invention, door sills 4 and 5 are designed as bass speaker boxes which are components of a HiFi or sound system of the automobile, the sound system otherwise not being shown and being provided for the purpose of reproducing, in particular, music.

Each of these side members 3, or door sills 4 and 5, are of hollow design and have in their interior a partition 6 running longitudinally in the direction of the vehicle, which partition divides the interior of side member 3 into two cavities 7 and 8: Cavity 7 facing passenger compartment 9 is hereafter identified as "inner or inside cavity," while cavity 8 facing away from passenger compartment 9 is hereafter identified as "outer or outside cavity." In place of the essentially vertical partition 6, it is also possible in another embodiment to dispose the partition formed in side member 3 horizontally or at any desired inclination relative to a horizontal plane.

A bass speaker 10 is mounted on partition 6 in an end region of side member 3 facing the rear of the vehicle, a front side 11 of bass speaker 10 being associated with inner cavity 7 and a rear side 12 of bass speaker 10 being associated with outer cavity 8. As a result, the sound waves generated by bass speaker 10 are radiated both into inside cavity 7, symbolized by arrow a, and also – correspondingly phase-shifted – into outside cavity 8, as symbolized by arrow b.

In and end region facing away from speaker 10, side member 3 has two bass ports 13 and 14 which open into a footwell 17 of the passenger compartment 9 near a driver's seat 15 or a passenger seat 16. Bass port 13 is associated with inside cavity 7 and has an arched diversion tube 18 which emerges into inside cavity 7. In contrast thereto, bass port 14 is associated with outside cavity 8 and is equipped with an arched diversion tube 19 which emerges into outside cavity 8, where diversion tube 19 penetrates partition 6. The sound waves propagating in the longitudinal direction of the vehicle 2 into cavities 7 and 8 are diverted by diversion tubes 18 and 19 such that they enter passenger compartment 9, as indicated by arrows c, essentially at right angles to longitudinal direction of the vehicle 2.

Base ports 13 and 14 are separated in the longitudinal direction of the vehicle 2 from each other, where the distance between the two bass ports 13 and 14 is tuned to the phase shift between the sound waves propagating in cavities 7 and 8 such that when the sound waves radiate into passenger compartment 9 an advantageous bass boost is created, at least within a preferred frequency range.

The bass speaker box accommodated in side member 3 is advantageously designed as a bass-reflex speaker box. Side member 3 here forms a so-called bass tube.

It is self-evident that the beams or side members 3 functioning as the bass speaker boxes are completely enclosed except for bass ports 13 and 14.